



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

down the flue may so disturb the nervous sleeper that he is determined to be rid of such an annoyance; he accordingly prepares in the habitation of these birds a fire of straw; the parents of the unfledged young flee in dismay, and rise above their smoking tenement and wheel about in terror, then dive down near its top as though they would rescue their suffocating brood from a death so awful. At last their courage gone they turn and soar away above the scene, while their young drop one by one in the fire below, and the parental feelings of the old birds induce them to linger about their desolate home for many days. To obviate this inhuman practice, a board placed on the top of the chimney before they commence breeding is all that is necessary.

THE STRUCTURE OF THE PITCHER PLANT.

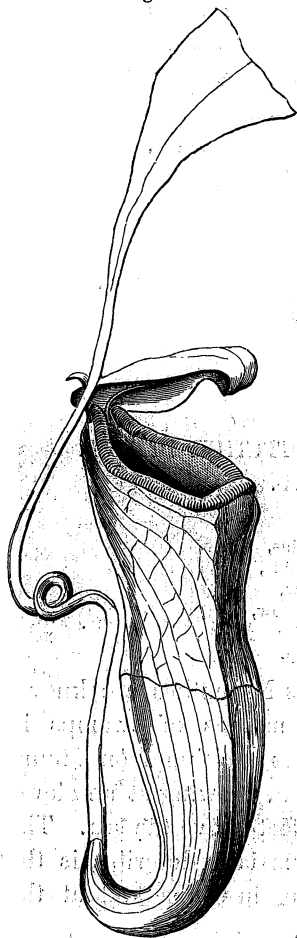
BY J. G. HUNT, M. D.

“High among the mountains,
Near the bubbling fountains,
Where the trees bend low,
Where the wild flowers grow,
'Mid the shadows deep”
Nepenthe's pitchers weep.

ABOUT twenty species of the genus *Nepenthes* are known to botanists, and while some are natives of swamps in Africa and China, most of the species are found on Mount Kinau Ballou, in the Island of Borneo, growing at an elevation of from three to eight thousand feet above the sea. The species whose minute anatomy we partially describe, is the *Nepenthes distillatoria*, found growing in China and at the Cape of Good Hope. This plant often attains the length of ten or twelve feet, generally lying prostrate, or partially supported by other plants. It bathes its roots in the hot swamps near the coast, but cannot lift its flowers very high in the sunshine, because its branching stem which bears many long and partly clasping leaves, and also its precious

burthen of watercups, is too feeble to support the weight. Seldom does the stem exceed two inches in diameter, being long and flexible like a rope.

Fig. 1.



Now, as all readers of the NATURALIST may not be botanists, we will state that the plants in question bear on the ends of their leaves peculiar appendages not unlike pitchers in form, and hence they are commonly known as pitcher-plants. Like the pitchers we use for domestic purposes, they are often colored with many gorgeous tints, and fashioned into graceful shapes, often with a capacity to hold more than a quart of liquid. As nature is seldom outdone by art, these forest cups have the ability to fill themselves, thus differing in an important respect from the pitchers we use.

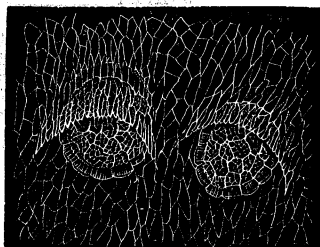
For a long time it has been a question where this liquid came from, and our knowledge of the subject is still too limited to say from what part of the plant it is poured out, though *it is probable* special glands have been set apart to perform that function. To decide this question, certainly, would require close observation on the living pitchers, and that would be very

difficult, because in their early stages of growth they are tightly closed by the curious lids at the top, and in the young state excretion is most rapid and copious.

Fig. 1 is an accurate drawing made (half size) from a pitcher that had been rendered transparent in order to show

its venation, and the position of both sets of glands. Minute dots, commencing at the bottom and extending to high-water mark,* represent the position and number of one series of

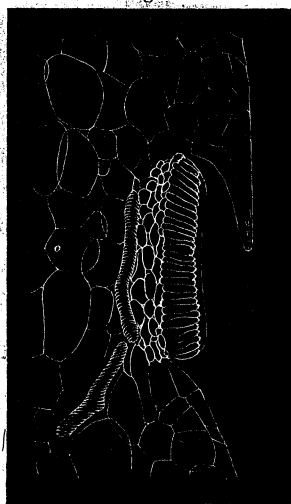
Fig. 2.



glands, all on the inside of the pitcher. The under side of the lid also is covered with similar glands, having among them, however, numerous stomata.

Fig. 2 shows a camera lucida drawing (magnified eighty diameters) of these glands, also rendered transparent, so that their anatomy may be seen at one view. They are depressed below the inner surface of the pitcher, and have, extending over nearly half the diameter of each, a projection of the epidermis like many little roofs, so that a stream of water poured in at the top would reach the bottom of the pitcher without touching a gland. The fine reticulation marking the surface of each, is caused by the ends of long columnar cells making up the gland structure, and these columnar cells rest on others of larger size, shown in the drawing. All the parts just described are best seen by a perpendicular section (Fig. 3, magnified one hundred and sixty diameters), and it may also be observed that each gland lies immediately over large isolated and *spiral* cells, which have no vascular connection with the ordinary spiral structure of the plant.

Fig. 3.



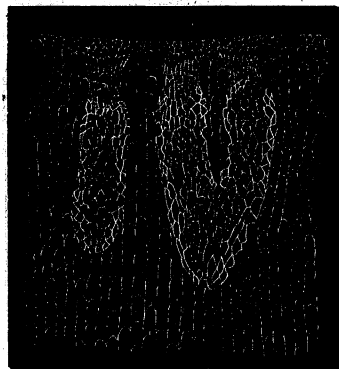
In a description, without illustrations, of this series of glands, published in the "Edinburgh New Philosophical

*Crossing the middle of the pitcher; the dots are omitted in the figure.

Journal" for 1832 and 1833, by Treviranus, he says the cuticle does not cover the glandular surface; it is, however, very easy to demonstrate that it is reflected down over each gland, and whatever liquid is excreted must filter through this cuticular covering before it falls into the pitcher.

By referring again to Fig. 1, it will be seen that a thickened margin or frill surrounds nearly the entire top of the pitcher. Now, embedded in this fleshy frill, lie many elongated, cylindrical glands, like guns on a fortification, all opening on its inner side by minute ducts which lead up to

Fig. 4.



the glands. The size of these very peculiar organs varies, as shown in Fig. 4 (magnified eighty diameters), and sometimes they are united at the ends, though this can be regarded only as a curious malformation. The drawing shows the union of the ducts with each gland, and also their cellular structure, better than many words could describe it. In a

side view of one of these glands, we see it is somewhat crescentic in shape; the orifice of the duct is apparent, and also the position of the gland with respect to the epidermis which covers the frill. This second series of organs lies embedded in a tissue, made up chiefly of large, isolated, spiral cells, developed to a degree not found probably in any other plant. Treviranus seems not to have been aware of these upper glands in *Nepenthes*, nor have we seen them noticed by any authority before.

In describing the structures alluded to in this paper, we have used the term gland for want of a better one, but we do not therefore assume any speciality of function. This is a point about which we are ignorant. The structure of an organ will not enable us to predict its function, though it

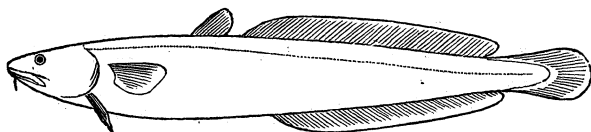
may afford rational ground for guess-work. Will not some one having the opportunity make observations on these singular organs in the living plant, in order to settle their function? We know not anywhere else in the vegetable kingdom organs more *apparently* set apart for a special purpose, and yet we are in doubt about their meaning.

Our native *Sarracenia* growing abundantly in swamps, with its cups, often the graves of drowned flies, is also called a pitcher plant, but differs widely in structure and habit from the *Nepenthes*. We allude to it now only to express our intention, if opportunity should offer, to illustrate its singular structure, as well as that of others of these remarkable plants, which nature *seems* to have appointed to set their traps among the swamps, but for what purpose, perhaps, we are not ready to explain.

We have been assisted in illustrating this paper by Miss Mary Peart and Miss Emma Walter, and the drawings were made from specimens in our possession.

THE COMPRESSED BURBOT OR EEL-POUT.*

BY WILLIAM WOOD, M. D.



Of the genus *Lota*, there are several species. The English Burbolt (Burbot), as described by Yarrell in his work on British fishes, and by Couch, belongs to this genus, yet probably is a different species from any in our lakes and rivers. Couch says, "the Burbolt (Burbot) is the only one of the extensive family of the codfishes which has its residence in fresh water, where it is distinguished by exhibiting some of

* *Lota compressa* Lesueur.